

REMARKS

This preliminary amendment is being filed with an RCE in response to a final office action dated March 13, 2003.

Claims 5-20 are pending. Claims 5 and 6 have been amended to clarify the subject matter. In particular, claim 5 has been amended to make clear that "first and second drain regions are formed by a single step of implanting the impurity and forming the first gate insulation by applying heat treatment." Claim 5 also clarifies that implanting an impurity of a first conductive type in a semiconductor substrate of a second conductive type "wherein the implantation is a single implantation." Claim 6 clarifies that the first drain region has a lower impurity concentration than the second drain region. Support for these amendments can be found, for example, the specification including the claims and the drawings. No new matter has been added

The previous final office action rejected claims 5-7 and 19 as being anticipated by Kwon et al. Applicants submit that the cited claims are not anticipated for the following reasons.

Amended claim 5 recites:

5. (Currently Amended) A method of manufacturing a semiconductor device comprising:
implanting an impurity of a first conductive type in a semiconductor substrate of a second conductive type, **wherein the implantation is a single implantation;**
providing a first gate insulation film on the semiconductor substrate;
diffusing the implanted impurity in the substrate **through a first gate insulation film formed on the semiconductor substrate by applying a heat treatment, so as to form a first drain region partially under the first gate insulation film and a second drain region adjacent to and above the first drain region, said first drain region having a different impurity concentration than the second drain region, wherein first and second drain regions are formed by a single step of implanting the impurity and forming the first gate insulation by applying heat treatment;**
providing a second gate insulation film on the semiconductor substrate except where the first gate insulation film is disposed;
providing a gate electrode that spans from the first gate insulation film to the second gate insulation film;
providing a source region of the first conductive type disposed proximally to one end of said gate electrode; and
providing a third drain region of the first conductive type disposed distally from the other end of said gate electrode and disposed in said second drain region. (Emphasis added.)

The present invention as claimed in claim 5 is not anticipated at least for the bolded features indicated above. In the present invention, the first and second drain regions of different impurity concentrations are formed by diffusing the previously **single** implanted impurity. In contrast, Kwon et al. does not show drain regions with different impurity concentrations. Kwon et al. shows a single drain region 36. Kwon et al.'s region 24, which is alleged to be a drain region in the office action, is a drift region. Further, even if assuming *arguendo* that the drift region 24 and the drain region 36 correspond to the first and second drain regions of the present invention, respectively, Kwon et al. still does not disclose "diffusing the implanted impurity in the substrate through a first gate insulation film formed on the semiconductor substrate by applying a heat treatment, so as to form a first drain region partially under the first gate insulation film and a second drain region adjacent to and above the first drain region, said first drain region having a different impurity concentration than the second drain region, wherein first and second drain regions are formed by a **single step** of implanting the impurity and forming the first gate insulation by applying heat treatment." This is because Kwon et al.'s regions 24 and 36 are **separately** produced by **different** implantations requiring **multiple steps** (see Figs. 1 to 4). That is, the drift region 24 is **first** formed as shown in Fig. 2 and the drain region 36 is **later** formed in a separate implantation as shown in Fig. 4. In addition, in the present invention, implanting an impurity of a first conductive type in a semiconductor substrate of a second conductive type such that the "implantation is a single implantation." That is, in the present invention, the different drain regions are produced by a **single** implantation followed by diffusion of implanted impurities as a **single step**. Thus, the present invention of claim 5 is not anticipated at least for the reasons above.

Moreover, in the Kwon reference, after an Epitaxial layer 14 is formed as shown in Fig. 1, a (N) dopant is implanted in order to form a drift region 24. When a thick insulator layer 26 is formed, the dopant is diffused and the drift region 24 is formed. That is, before the thick insulator layer is formed, **the Epitaxial layer corresponding to a second drain region 5B in the present application still exists**. As a result, forming a thick insulator **only forms the drift**

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region 24 corresponding to the first drain region 5A of the present application. Thus, at least for this reason, claim 5 is not anticipated by Kwon et al.

For the foregoing reasons, the preset invention of claim 5 is not anticipated by the cited prior art. Moreover, claims 6 to 20, which depend on claim 5 directly or indirectly, are not anticipated at least for the same reason as claim 5. Thus, Applicants respectfully request that all pending claims be allowed.

Enclosed is a check for a 2-month extension fee. Applicant asks that all claims be examined in view of the amendment to the claims.

Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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